

REMARKS

The invention relates to textile floorcoverings composed of more than one layer, wherein the layers have been bonded by an adhesive which comprises, as binder, as aqueous dispersion of a mixture made from a polymer A) at least 60% by weight of which is composed of ethylene and from a polymer B) at least 60 by weight of which is composed of vinylaromatics, dienes or mixtures of these, wherein the textile floorcovering is preferably a tufted carpet. Such carpets are traditionally made by bonding a tufted backing fabric with a secondary backing using an adhesive. Such adhesives have included styrene-butadiene copolymers. Such adhesives have also been used as a precoat in which pile material is tufted through the backing fabric, i.e., pulled and then fixed by applying a binder. The prior art adhesives have not been fully satisfactory.

As recited in Claim 1, the present invention is a textile floorcovering having more than one layer, wherein the layers have been bonded by an adhesive which comprises, as binder, an aqueous dispersion of a mixture made from a polymer A), at least 60% by weight of which is composed of ethylene and from a polymer B), at least 60% by weight of which is composed of vinylaromatics, dienes or mixtures of these, wherein the textile floorcovering is a tufted carpet, and wherein one layer is a tufted backing fabric, and one layer is a secondary backing bonded to said tufted backing fabric by said adhesive.

Additionally, as recited in Claim 13, the invention is an aqueous adhesive comprising, as binder, an aqueous dispersion of a mixture made from a polymer A), at least 60% by weight of which is composed of ethylene and from a polymer B), at least 60% by weight of which is composed of vinylaromatics, dienes or mixtures of these, and comprising a thickener, where the thickener is a copolymer of ethylenically unsaturated compounds at least 50% by weight of which are ethylenically unsaturated acids, ethylenically unsaturated amides or mixtures of these.

As recited in Claim 21, the invention is also a textile floorcovering having more than one layer, wherein the layers have been bonded by an adhesive which comprises, as binder, an aqueous dispersion of a mixture made from a polymer A), at least 60% by weight of which is composed of ethylene and from a polymer B), at least 60% by weight of which is composed of vinylaromatics, dienes or mixtures of these, wherein the proportion by weight of the polymer A) is less than 10% by weight, based on the total of A) and B).

The claimed inventions also include a process for producing a textile floorcovering.

The specification contains comparative data between the presently-claimed invention, and prior art adhesives based on butadiene/styrene copolymer. Table 1 at pages 8-9 of the specification lists precoats and adhesives used in the comparative data, reproduced below:

Table 1:

	Constituents	Parts by weight (dry)
Precoat 1	SN LD 611	100
	Chalk W 12	500
	Latekol D	0.2
	Solids content 78 %	
Precoat 2	SN LD 791	100
	Latekol D	0.2
Precoat 3	SN LD 791	100
	Chalk W 12	800
	Latekol D	0.2
	Solids content 78 %	
Adhesive 1	SN LD 611	100
	Chalk W 12	250
	Latekol D	0.2
	Solids content 78 %	
Adhesive 2	SN LD 611	95
	Poligen WE 3	5
	Collacral HP	1.0
	Solids content 50 %	
Adhesive 3	SN LD 611	90
	Polygen W3	10
	Collacral HP	1
	Solids content 47,5 %	
Adhesive 4	SN LD 611	100
	Chalk W 12	250
	Latekol D	0.2
	Solids content 75 %	
Adhesive 5	SN LD 611	100
	Latekol D	0.2
	Solids content 53 %	
Adhesive 6	SN LD 611	95
	Polygen W3	5
	Latekol D	1
Adhesive 7	SN LD 611	90
	Polygen W3	10
	Latekol D	1

Meanings of terms:

SN LD 611: Styrofan® LD 611, butadiene/styrene copolymer, ethylene

Poligen® WE 3: ethylene/acrylic acid copolymer

Chalk W 12: Calcicol W 12 from Alpha Calcit

Collacral®: thickener, acrylic acid/acrylamide copolymer

Latekol® D: thickener, polyacrylic acid

Adhesives 1, 4 and 5 are for purposes of comparison, since they do not contain presently-recited polymer A). With preliminary application of one of the precoats, the strength of the bond between a precoated backing fabric and a secondary backing was determined, as described in the specification beginning at page 9, line 37. Using three different combinations of tufted backing fabric and secondary backing, wet and dry strength adhesive performance was evaluated, as shown in Tables 2-4, at pages 10-11 of the specification, reproduced below:

Table 2:
Bond strength (5/32 wool fiber tufted into woven polypropylene (900 g/m²); secondary backing: polypropylene needlefelt, 375 g/m²)

	Amount applied (dry)		dry		wet	
	Precoat	Adhesive	F	F max	F	F max
Precoat 1, Adhesive 4*)	650	800	39.2	54.9	22.3	27.1
Precoat 1, Adhesive 2	650	230	44.6**)	64.6**)	33.1	37.9
Precoat 1, Adhesive 2	650	180	72.9	83.0	50.4	35.5
Precoat 1, Adhesive 3	650	230	45.6**)	73.0**)	43.4	53.2
Precoat 1, Adhesive 3	650	180	63.2	78.2	38.4	45.9
Precoat 2, Adhesive 2	100	230	46.4**)	64.9**)	42.8	53.6
Precoat 1, Adhesive 5*)	650	230	42.1	53.1	-	-
Precoat 1 Adhesive 7	650	230	41.9**)	65.5**)	44.2	52.5

*) for comparison

**) tufted threads were pulled out of the backing fabric

Table 3:

Bond strength (1/8 polyamide fiber tufted into woven polypropylene (625 g/m²); secondary backing: polypropylene needlefelt (375 g/m²))

	Amount applied (dry)		dry		wet	
	Precoat	Adhesive	F	F max	F	F max
Precoat 1, Adhesive 2	650	230	63.0	68.1	28.9	34.9
Precoat 2, Adhesive 2	100	230	100.1	107.7	33.5	39.9

Table 4:

Bond strength (5/32 polypropylene fiber tufted into polypropylene (650 g/m²); secondary backing: polypropylene needlefelt (330 g/m²))

	Amount applied (dry)		dry		wet	
	Precoat	Adhesive	F	F max	F	F max
Precoat 3, Adhesive 4*)	780	550	10.7	16.3	6.4	7.7
Precoat 3, Adhesive 2	780	160	34.0	40.8	21.6	26.3
Precoat 2, Adhesive 2	90	160	24.1	27.7	10.9	12.7

As shown therein, the prior art adhesives were generally inferior to the adhesive of the presently-claimed invention.

The above-discussed results could not have been predicted by the applied prior art, which is now discussed.

The rejection of Claims 1-3, 7, 8, 11, 12, 14 and 15 under 35 U.S.C. § 102(b) as anticipated by JP58-152037 (JP '037), is respectfully traversed. According to the English abstract thereof, JP '037 discloses a fireproof backing composition for carpeting comprising the combination of a fire-retarding plasticizer and a polymer composition, which polymer composition consists of 40-95 wt% of an emulsion of vinyl chloride-ethylene (III) or vinyl chloride-vinyl acetate-ethylene copolymer (IV) or their modified material (V), and 5-60% of

a synthetic rubber latex (VI), which synthetic rubber latex may be a butadiene copolymer such as styrene-butadiene, acrylonitrile-butadiene, or methyl methacrylate-butadiene. JP '037 further discloses that the weight ratio of vinyl chloride to ethylene to vinyl acetate in (presumably) components (III) and (IV) is 30-95:5-70:55-0.

The Examiner now relies on an English translation of the full text of JP '037 prepared by the PTO. The Examiner relies on the English translation at pages 10 and 11 as allegedly disclosing the presently-claimed textile floor covering. In reply, it appears that the composition of JP '037 is analogous to the presently-disclosed precoat, which precoat is used to fix the tufted threads in the backing fabric, as described in the specification herein in the paragraph bridging pages 7 and 8. Indeed, the English translation at the third paragraph of page 10 discloses that "piles are strongly fixed in the laying article treated with the flame-retardant packing [sic] composition of the present invention, and the adhesion with a secondary processing material is also good." The Examiner appears to assume that the term "the adhesion with a secondary processing material is also good" means that the composition of JP '037 is used as is the present composition, i.e., to bond a tufted backing fabric with a secondary backing. However, since JP '037 discloses drying their composition prior to affixing any secondary backing, JP '037 can also be interpreted as their composition allowing for the use of a subsequent, and not defined, adhesive being used to bond with a secondary backing.

Even if the Examiner's interpretation were correct and Applicants' interpretation were not, new Claims 22-29 would be separately patentable, since the components and their percentages for polymer A) and the relative amounts of polymer A) and polymer B) are outside the scope of JP '037.

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

The rejection of Claims 1-3, 7, 8, 11, 12, 14, 15, 18 and 19 under 35 U.S.C. § 102(b) as anticipated by JP58-041972 (JP '972), is respectfully traversed. According to the English abstract thereof, JP '972 discloses a fireproof backing composition for carpeting comprising the combination a polymer composition containing 90-10 wt% of an emulsion of vinyl chloride-ethylene or vinyl chloride-vinyl acetate-ethylene copolymer, or modified by a functional monomer, such as acrylic acid, and 10-90% of a synthetic rubber latex, which may be a butadiene copolymer such as styrene-butadiene, acrylonitrile-butadiene, or methyl methacrylate-butadiene. JP '972 further discloses that the weight ratio of vinyl chloride to ethylene to vinyl acetate is (presumably) 30-95:5-70:55-0, and that the composition optionally contains a thickening agent and flame-retarding agent.

The Examiner now relies on an English translation of the full text of JP '972 prepared by the PTO, as allegedly disclosing the presently-claimed textile floor covering. In reply, it appears that the composition of JP '972 is analogous to the presently-disclosed precoat, which precoat is used to fix the tufted threads in the backing fabric, as described in the specification herein in the paragraph bridging pages 7 and 8. Indeed, the English translation at the third paragraph of page 9 discloses that "piles are strongly fixed in the laying article treated with the flame-retardant packing [sic] composition of the present invention, and the adhesion with a secondary processing material is also good." The Examiner appears to assume that the term "the adhesion with a secondary processing material is also good" means that the composition of JP '972 is used as is the present composition, i.e., to bond a tufted backing fabric with a secondary backing. However, since JP '972 discloses drying their composition prior to affixing any secondary backing, JP '972 can also be interpreted as their composition allowing for the use of a subsequent, and not defined, adhesive being used to bond with a secondary backing. Indeed, the English translation at page 9, second paragraph, exemplifies secondary processing as "a woven hemp fabric is adhered in a superposed fashion after spreading the

composition, or after drying, a film is formed by melting a thermoplastic synthetic resin such as polyethylene," thereby suggesting that a thermoplastic resin such as ethylene performs the function of the presently-recited adhesive.

Even if the Examiner's interpretation were correct and Applicants' interpretation were not, new Claims 22, 23 and 25-29 would be separately patentable, since the components and their percentages for polymer A) and the relative amounts of polymer A) and polymer B) are outside the scope of JP '972. Note that JP '972 discloses that it is especially important that their copolymer (A) contain 30-95% vinyl chloride.

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

The rejections under 35 U.S.C. § 103(a) of:

Claims 16 and 17 over either JP '037 or JP '972;

Claim 4 over JP '037 or JP '972 in view of U.S. 6,162,848 (Lattime et al);

Claims 5, 6 and 13 over JP '037 or JP '972 in view of U.S. 5,851,625 (Smesney et al);

and

Claims 20 and 21 over JP '972,

are respectfully traversed.

The disclosures and deficiencies of JP '037 and JP '972 have been discussed above.

Neither Lattime et al nor Smesney et al remedy these deficiencies.

Thus, even if a styrene-butadiene rubber of JP '037 or JP '972 were carboxylated, as disclosed by Lattime et al, the result would still not be the presently-claimed invention.

Similarly, even if a thickener, as disclosed by Smesney et al, were added to the carpet backing composition of JP '037 or JP '972, the result would not be the presently-claimed invention.

For all the above reasons, it is respectfully requested that these rejections be withdrawn.

The rejection of Claim 21 under 35 U.S.C. § 103(a) as obvious over U.S. 5,403,884 (Perlinski), is respectfully traversed.

Perlinski discloses a process for flocking cured or uncured elastomeric substrates comprising the steps of applying to the substrate an aqueous adhesive comprising 10 to 100% of an alkaline dispersion of an ethylene carboxylic acid copolymer and 0 to 90% of an aqueous elastomeric dispersion; electrostatically applying flocking fibers thereto, and drying the thus-flocked substrate (column 1, lines 52-58). The ethylene carboxylic acid copolymer is preferably present in an amount of 50 to 70% by weight (dry) of the flocking adhesive composition. The aqueous elastomeric dispersion may be, for example, carboxylated styrene-butadiene (column 5, lines 1-5). In the exemplified adhesives of Perlinski which contain such a carboxylated styrene-butadiene (adhesives A and D), the amount of ethylene carboxylic acid copolymer, i.e., ethylene-acrylic acid copolymer, is approximately 73% by weight of the total amount of said copolymer and the carboxylated styrene-butadiene [$240 \div (240 + 85)$]. Perlinski discloses additionally that "viscosity improvers such as fumed silica, etc." can be added (column 6, lines 11-14).

Perlinski neither discloses nor otherwise the presently-claimed invention of Claim 21, since the amount of polymer A) is outside the respective amount disclosed in Perlinski.

In the Office Action, the Examiner finds that since Perlinski discloses a minimum amount of 10%, then it would be obvious to employ an amount less than 10%, such as 9%, since it has been held that discovering an optimum value of a result-effective variable requires only routine skill in the art.

In reply, the Examiner's argument might have some weight if Applicants were asserting that they have found an optimum percentage between the 10-100% range in Perlinski. However, Claim 21 is outside this range. It is clearly not obvious to optimize a variable outside the range in the reference. Moreover, Perlinski discloses a preferred range of

50-70%. Thus, Perlinski already directs a person skilled in the art that if optimization is to be further carried out, it would be within the 50-70% range. Thus, Perlinski actually directs persons skilled in the art away from 10%, let alone a percentage less than 10%.

In the present Office Action, the Examiner has not responded to Applicants' arguments, even though this rejection has been repeated. Thus, Applicants do not have the benefit of the Examiner's reasons for not accepting these arguments. Therefore, if the present response does not put this application in condition for allowance, then Applicants' respectfully submit that the next Office Action on the merits not be made Final.

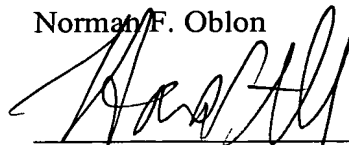
For all the above reasons, it is respectfully requested that the rejection over Perlinski be withdrawn.

The rejection of Claim 13 under 35 U.S.C. § 103(a) as unpatentable over Perlinski in view of Smesny et al, is respectfully traversed. The disclosures and deficiencies of Perlinski have been discussed above. Smesny et al does not remedy these deficiencies. Even if a thickener, as disclosed by Smesny et al, were added to the aqueous adhesive of Perlinski, the result would still not be the presently-claimed invention. Accordingly, it is respectfully requested that this rejection be withdrawn.

All of the presently-pending claims in this application are now believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Respectfully submitted,

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